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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,827	06/15/2001	Shuo-Yen Robert Li	Li 11	7765

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John T Peoples
14 Blue Jay Court
Warren, NJ 07059

EXAMINER

LEE, ANDREW CHUNG CHEUNG

ART UNIT PAPER NUMBER

2664

DATE MAILED: 03/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action SummaryApplication No. ☒

09/881,827

Applicant(s)

LI, SHUO-YEN ROBERT

Examiner

Andrew C Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22 - 42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22 - 42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 06/15/01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because the unlabeled rectangular boxes (and/or circles and triangular boxes) shown in the drawings should be provided with descriptive text labels — Referring to drawings, page 1, Fig. 1A; page 2, Fig. 2A to 2F; page 3, Fig. 3A to 3B; page 4, Fig. 4; page 5, Fig. 5A to 5B; page 7, Fig. 6B; page 8, Fig. 6C to 6D; page 9, Fig. 6E to 6F; page 10, Fig. 7; page 12, Fig. 9; page 13, Fig. 10; page 15, Fig. 12; page 16, Fig. 13; page 17, Fig. 14; page 18, Fig. 15; page 19, Fig. 16; page 20, Fig. 17; page 21, Fig. 18; page 22, Fig. 19; page 23, Fig. 20; page 24, Fig. 21A to 21D; page 25, Fig. 22; page 26, Fig. 23; page 27, Fig. 24; page 28, Fig. 25 and 26; page 31, Fig. 29; page 34, Fig. 32A and 32B; page 35, Fig. 32C and 32D; page 36, Fig. 33A to 33F; page 37, Fig. 34; page 38, Fig. 35A to 35P; page 39, Fig. 36A to 36P; page 40, Fig. 37A to 37P; page 41, Fig. 38A; page 42, Fig. 38B; page 44, Fig. 40; page 46, Fig. 42; page 47, Fig. 43; page 48, Fig. 44A to 44C; page 53, Fig. 49A to 49E; page 54, Fig. 50A to 50E; page 55, Fig. 51; page 56, Fig. 52; page 57, Fig. 53; page 58, Fig. 54; page 59, Fig. 55; page 60, Fig. 56A to 56D; page 61, Fig. 57; page 62, Fig. 58; page 64, Fig. 60; page 65, Fig. 61; page 67, Fig. 62B; page 69, Fig. 63B; page 72, Fig. 65B and 65C; page 73, Fig. 65D and 65E; page 85, Fig. 69; page 86, Fig. 70A; page 87, Fig. 70B; page 88, Fig. 71A; page 89, Fig. 71B; page 90, Fig. 72A; page 91, Fig. 72B; page 92, Fig. 73A; page 93, Fig. 73B; page 94, Fig. 74; page 95, Fig. 75A; page 97, Fig. 75C.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended

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replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:
 - The unlabeled rectangular boxes (and/or circles and triangular boxes) shown in the drawings (Fig. 1 through Fig. 75C) should be provided with descriptive text labels.
 - Fig. 75C is not completed. The left side of the element 20059 is missing.
- Appropriate correction is required.

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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5. Claims 22 – 42 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 – 21 of U.S. Patent No. 6657998 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Regarding claim 22, a method for implementing a class of $N \times N$ (see US. Patent No. 6657998 B2, column 83, line 50) ... each serving a connection request to route m incoming signals, $m \leq N$, and for enabling the service of any connection request in a nonblocking way on the condition that the connection request is compliant to certain constraints, the method for each of the (see US. Patent No. 6657998 B2, column 83, lines 51 – 56).... comprising configuring a switch defined by a set of connection states and having an array of N input ports with N distinct input addresses and an array of N output ports with N distinct output addresses (see US. Patent No. 6657998 B2, column 83, lines 57 – 60)

wherein the m incoming signals arrive at m distinct input ports determining m active input addresses and are destined for corresponding m distinct output ports (see US. Patent No. 6657998 B2, column 84, lines 7 – 9)

routing the incoming signals from the m distinct input ports to the corresponding m distinct output ports by activating one of the connection states such that the activated one of the connection states accommodates the connection request subject to said constraints on the connection request (see US. Patent No. 6657998 B2, column 84, lines 14 – 19).

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Regarding claim 23, the method as recited in claim 22 wherein the configuring includes constructing the switch as an $N \times N$ k-stage switching network composed of k stages of nodes, an interstage exchange between any succeeding two of the k stages, an input exchange and an output exchange, and wherein each node is filled with another switch (see US. Patent No. 6657998 B2, column 84, lines 20 – 25).

Regarding claim 24, The method as recited in claim 22 wherein the configuring includes constructing the switch as an $N \times N$ k-stage switching network composed of k stages of nodes, an interstage exchange between any succeeding two of the k stages, an input exchange and an output exchange, and wherein each node is filled with..... (see US. Patent No. 6657998 B2, column 84, lines 26 – 32).

Regarding claim 25, The method as recited in claim 22 wherein the configuring includes constructing the switch as a two-stage interconnection network composed of a first stage of nodes being the input nodes and a second stage of nodes being the output nodes, an interstage exchange, and an input exchange corresponding to the interstage exchange prepended to the network, and wherein each node is filled with (see US. Patent No. 6657998 B2, column 84, lines 33 – 40).

Regarding claim 26, the method as recited in claim 22 wherein the configuring includes constructing the switch as an X^2 interconnection network having nodes and

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wherein each node is filled with (see US. Patent No. 6657998 B2, column 84, lines 41 – 44).

Regarding claim 27, the method as recited in claim 22 wherein the configuring includes constructing the switch as an X2 interconnection network having nodes and wherein the nodes are filled with a plurality of (see US. Patent No. 6657998 B2, column 84, lines 45 – 49).

Regarding claim 28, the method as recited in claim 22 wherein the configuring includes constructing the switch as a recursive X2 interconnection network having nodes and wherein each node is filled with (see US. Patent No. 6657998 B2, column 84, lines 50 – 54).

Regarding claim 29, The method as recited in claim 22 wherein the configuring includes constructing the switch as a recursive X2 interconnection network having nodes and wherein the nodes are filled with a plurality of (see US. Patent No. 6657998 B2, column 84, lines 55 – 59).

Regarding claim 30, the method as recited in claim 22 wherein the configuring includes constructing the switch as a recursive X2 interconnection network having nodes and wherein each of the nodes is a cell and each cell is filled with a 2x2 (see US. Patent No. 6657998 B2, column 84, lines 60 – 64).

Regarding claim 31, the method as recited in claim 30 wherein the 2x2 is a switching cell (see US. Patent No. 6657998 B2, column 84, lines 65 – 66).

Regarding claim 32, the method as recited in claim 22 wherein the configuring includes constructing the switch as a recursive X2 interconnection network of cells with each cell filled with a 2x2 (see US. Patent No. 6657998 B2, column 84, lines 67 – 68; column 85, lines 1 – 2).

Regarding claim 33, the method as recited in claim 32 wherein the 2x2 is a switching cell (see US. Patent No. 6657998 B2, column 85, lines 3 – 4).

Regarding claim 34, the method as recited in claim 22 wherein the configuring includes constructing the switch as a banyan-type network whose trace and guide are both monotonically increasing and wherein each of the 2x2 nodes of the banyan-type network is filled with a 2x2 (see US. Patent No. 6657998 B2, column 85, lines 5 – 10).

Regarding claim 35, the method as recited in claims from 34 wherein the 2x2 is a switching cell (see US. Patent No. 6657998 B2, column 85, lines 11 – 13).

Regarding claim 36, the method as recited in claim 22 wherein the configuring includes constructing the switch as a recursive plain 2-stage interconnection network of cells prepended with a swap exchange and wherein each cell of the network is filled with a 2x2(see US. Patent No. 6657998 B2, column 85, lines 14 – 18).

Regarding claim 37, the method as recited in claim 36 wherein the 2x2 is a switching cell (see US. Patent No. 6657998 B2, column 85, lines 19 – 20).

Regarding claim 38, the method as recited in claim 22 wherein the configuring includes constructing the switch as a divide-and-conquer network of cells prepended with a swap exchange and wherein each cell of the network is filled with a 2x2(see US. Patent No. 6657998 B2, column 85, lines 21 – 25)

Regarding claim 39, A class of NxN each serving a connection request to route m incoming signals, $m \leq N$, and for enabling the service of any connection request in a nonblocking way on the condition that the connection request is compliant to certain constraints, each of the comprising (see US. Patent No. 6657998 B2, column 85, lines 26 – 32)

a switch defined by a set of connection states and having an array of N input ports with N distinct input addresses and an array of N output ports with N distinct output addresses (see US. Patent No. 6657998 B2, column 85, lines 33 – 36)

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wherein the m incoming signals arrive at m distinct input ports determining m active input addresses and are destined for corresponding m distinct output ports ... (see US. Patent No. 6657998 B2, column 86, lines 6 – 8)

control circuitry, coupled to the switch, for routing the incoming signals from the input ports to the corresponding (m distinct) output ports by activating one of the connection states such that the activated one of the connection states accommodates the connection request subject to said constraints on the connection request (see US. Patent No. 6657998 B2, column 86, lines 13 – 19).

Regarding claim 40, theas recited in claim 39 wherein the switch is constructed by an $N \times N$ k -stage switching network composed of k stages of nodes, an interstage exchange between any succeeding two of the k stages, an input exchange and an output exchange, and wherein each node is filled with another switch (see US. Patent No. 6657998 B2, column 86, lines 20 – 26).

Regarding claim 41, theas recited in claim 39 wherein the switch is constructed by an $N \times N$ k -stage switching network composed of k stages of nodes, an interstage exchange between any succeeding two of the k stages, an input exchange and an output exchange, and wherein each node is filled with another (see US. Patent No. 6657998 B2, column 86, lines 27 – 33).

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Regarding claim 42, The as recited in claim 39 wherein the switch is constructed from a two-stage interconnection network composed of a first stage of nodes being the input nodes and a second stage of nodes being the output nodes, an interstage exchange, and an input exchange corresponding to the interstage exchange prepended to the network, and wherein each node is filled with another (see US. Patent No. 6657998 B2, column 86, lines 34 – 42).

6. Referring to claims 22 – 42, Applicant merely modifies the scope of U.S. Patent No. 6657998 B2 claims 1 – 21 by *replacing, eliminating, and adding* the reference terms and elements as indicated below:

Regarding claim 22, Applicant merely *replacing* the element “unimodal-circular nonblocking switches” from claim 1 of the patent with the element “upturned decompressors”;

eliminating “0,1,N – 1, the switch accommodating every complete matching between all N input addresses and all N output addresses by one of its connection states on the condition that, under the matching, the input addresses are a circular unimodal function of the output addresses, where a complete matching between all N input addresses and all N output addresses is equivalent to a combination of N concurrent point-to-point connections from the N input addresses to the N output addresses, and wherein said constraints on the connection request are that: there exists a combination of N concurrent point-to-point connections corresponding to a complete

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matching accommodated by the switch such that each of the..... determines a point-to-point connection which coincides with one of the point-to-point connections of said combination of N concurrent point-to-point connections accommodated by the switch, and" from claim 1 of the patent , and *replacing* with "determining m active output addresses, and wherein said constraints on the connection request are that: (1) the m active input addresses are consecutive upon a rotation of the ordering of the N input addresses, and (2) the correspondence between the m active input addresses and them active output addresses is,order reversing after the rotation", of claim 1 of the patent and

adding the term " $m \leq N$ " , to "each serving a connection request to route m incoming signals, $m \leq N$, and for enabling the service of any connection request in a nonblocking way on the condition that the connection request is compliant to certain constraints" of claim 1 of the patent , also replacing the terms " their respective" with "m distinct" and adding "m distinct" to "routing the incoming signals from their respective (*replacing with "the m distinct"*) input ports to the corresponding (*adding "m distinct"*) output ports by activating one of the connection states such that the activated one of the connection states accommodates the connection request subject to said constraints on the connection request" of claim 1 of the patent;

a method for implementing a class of NxN (see US. Patent No. 6657998 B2, column 83, line 50) ... each serving a connection request to route m incoming signals, $m \leq N$, and for enabling the service of any connection request in a nonblocking way on the condition that the connection request is compliant to certain constraints, the method

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for each of the (see US. Patent No. 6657998 B2, column 83, lines 51 – 56).. comprising configuring a switch defined by a set of connection states and having an array of N input ports with N distinct input addresses and an array of N output ports with N distinct output addresses (see US. Patent No. 6657998 B2, column 83, lines 57 – 60)

wherein the m incoming signals arrive at m distinct input ports determining m active input addresses and are destined for corresponding m distinct output ports (see US. Patent No. 6657998 B2, column 84, lines 7 – 9)

routing the incoming signals from the m distinct input ports to the corresponding m distinct output ports by activating one of the connection states such that the activated one of the connection states accommodates the connection request subject to said constraints on the connection request (see US. Patent No. 6657998 B2, column 84, lines 14 – 19).

Regarding claim 23, Applicant merely copying claim 2 of the patent without modifying the scope of the claim

Regarding claims 24 to 38, and 40 – 42, Applicant merely *replacing* the element “unimodal-circular nonblocking switches” from claims 3 to 17 and 19 – 21 of the patent with the element “upturned decompressors”, respectively.

Regarding claim 39, Applicant merely *replacing* the element “unimodal-circular nonblocking switches” from claim 18 of the patent with the element “upturned decompressors”;

eliminating “0,1, ...,N – 1, the switch accommodating every complete matching between all N input addresses and all N output addresses by one of its connection states on the condition that, under the matching, the input addresses are a circular unimodal function of the output addresses, where a complete matching between all N input addresses and all N output addresses is equivalent to a combination of N concurrent point-to-point connections from the N input addresses to the N output addresses, and wherein said constraints on the connection request are that: there exists a combination of N concurrent point-to-point connections corresponding to a complete matching accommodated by the switch such that each of the..... determines a point-to-point connection which coincides with one of the point-to-point connections of said combination of N concurrent point-to-point connections accommodated by the switch, and” from claim 1 of the patent , and *replacing* with “determining m active output addresses, and wherein said constraints on the connection request are that: (1) the m active input addresses are consecutive upon a rotation of the ordering of the N input addresses, and (2) the correspondence between the m active input addresses and them active output addresses is,order reversing after the rotation”, of claim 1 of the patent and

adding the term “ $m \leq N$ ” , to “each serving a connection request to route m incoming signals, $m \leq N$, and for enabling the service of any connection request in a

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nonblocking way on the condition that the connection request is compliant to certain constraints" of claim 1 of the patent , also replacing the terms " their respective" with "m distinct" and adding "m distinct" to "control circuitry, coupled to the switch, for routing the incoming signals from their respective (*replacing with "the m distinct"*) input ports to the corresponding (*adding "m distinct"*) output ports by activating one of the connection states such that the activated one of the connection states accommodates the connection request subject to said constraints on the connection request" of claim 1 of the patent.

It has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before. In re Karlson, 136 USPQ 184 (CCPA), a;Iso note Ex Parte Raine, 168 USPQ 375 (bd. App. 1969); omission of a reference element whose function is not needed would be obvious to one skilled in the art.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Zhang (U.S. Patent No. 5216668); Lee (U.S. Patent No. 6335930 B1); Lau (U.S. Patent No. 6052373); Yang et al. (U.S. Patent No. 5940389); Hughes et al. (U.S. Patent No. 6747971 B1); Yoshifuji (U.S. Patent No. 5450074); Okayama (U.S. Patent No. 6427037 B1) are cited to show apparatus and method for high speed

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broadband nonblocking switching and scalable communications system, which is considered pertinent to the claimed invention.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Lee whose telephone number is (571) 272-3131. The examiner can normally be reached on Monday through Friday from 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on (571) 272-3134. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ACL

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03 March 2005


Ajit Patel
Primary Examiner